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ABSTRACT

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Vocational indecision was defined as being both a college upperclass student and having no major. In a sample of 1622 students in college for three years, 24% "no majors" were found and compared with majors using pre-college measures of achievement, aptitude, and interest. Measures of interest differentiation were of particular concern. No major status was best predicted from present or past ability measures, e.g., high school mathematics grades and English Usage test scores. Non-academic predictors slightly augmented the multiple correlation including Outdoor interest, Business Contact interest, and interest differentiation. Most important to vocational indecision in these juniors and seniors, however, was lower intellectual ability.

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"A confusing picture" was Harman's (1973) view of the research literature on the correlates of vocational indecision in college students. He looked at three kinds of predictors--personality, interest, and ability measures--and found very little that differentiated counseling clients who had selected a major from those who had not. Nonetheless, perhaps because finding nothing is for counselors intuitively unsatisfying and for clients of little practical help, Harman made the most of his data and concluded that undecided students were less positive about themselves.

In much the same fashion Elton and Rose (1971) summarized their findings with graduating college seniors who were vocationally undecided as freshmen. Compared with freshmen who had decided on a major, the undecideds did not differ on any personality or ability measure. Nonetheless, these investigators went on to point out that 54% of the undecided had eventually chosen majors in Holland's Social and Enterprising groups. From this they inferred that inasmuch as these two major groups had the lowest overall ACT ability scores, "...ability is an important determinant of eventual occupational choice in the case of the undecided student (p. 91)."

This tendency to highlight whatever of significance turns up is understandable. Indecision about one's major has increased each year since 1971 among high school seniors (AGPA Guidepost, 1974, p. 6), and if this phenomenon foretells an increase in college as well, then it is imperative that the precursors of indecision be identified.

Holland (1973) has proposed a concept that should be related to vocational indecision in college, the concept of differentiation. Differentiation is the degree of flatness in an interest or personality profile. A very differentiated person has clear highs and lows on the Vocational Preference Inventory, while an undifferentiated person has a flat profile. Differentiation is hypothesized to be associated with more effective vocational functioning and stability of vocation choice. It therefore follows that vocational indecision in college students, particularly juniors and seniors, might be related to lack of differentiation in their interest profiles.

Method

The discovery of a sizable proportion of "pre-majors" among university students who had entered the University three years prior prompted the present study. There would seem to be no clearer operational definition of undifferentiation or Eriksonian identity confusion than beginning one's senior year sans major. A variety of achievement, aptitude, and interest measures taken in high school provided the basis for comparing the relative contribution to predicting no major from the variables most commonly assumed to be important.

Subjects. From the 3,000 freshmen entering the University of Washington autumn 1971 who had taken the Washington Pre-College (WPC) test battery in their junior year of high school (HS), 1622 were registered spring quarter 1974 and had 90 or more credit hours, i.e., at least junior standing. These students became the subjects of this study. The sample contained 45% females and had a mean age at time of testing of 16.5 years.

Instruments. Data from the WPC battery included HS GPA's in English, mathematics, natural science, social science, foreign language, electives, and overall, as well as the following test scores: English Composite, Vocabulary, English Usage, Spelling, Reading Speed, Reading Comprehension, Verbal Composite, Quantitative Skills, Data Sufficiency, Quantitative Judgment, Applied Mathematics, Mathematics Achievement, Quantitative Composite, Spatial Ability, and Mechanical Reasoning. In addition, sex, age, and planned major were available. Students indicated which of the following they planned to major in: Humanities, Social Science including Education, Biological Science, Physical Science, Engineering, Business, Vocational-Technical, and Other.

The interest measures came from the Vocational Interest Inventory (VII) which produces scores in eight occupational areas according to Roe's classification system (Mitchell, Lunneborg, and Lunneborg, 1971): Service, Business Contact, Organization, Technical, Outdoor, Science, General Cultural, and Arts & Entertainment. In addition to HS achievement as measured through GPA's, two indices of college achievement were available: total credit hours and cumulative GPA at the end of spring 1974.

Differentiation of interests on the VII was measured three different ways: (a) "Maximum-minimum" differentiation was that used by Holland

(1973) with the VPI--the absolute value of the difference between a person's highest and lowest VII standard scores. Thus, in the example which follows the Max-Min Dif score would be 14, 60 minus 46. (b) "Median differentiation" (Median Dif) was a score reflecting the sum of the absolute deviations of the eight standard scores from 50. Median Dif was thus a measure of one's deviation from average group performance. For example, a Median Dif score of 26 resulted from the following eight scores proceeding from Service to Arts & Entertainment: 50 53 60 49 46 46 47 51. (c) The third score, "random differentiation" (Random Dif) measured the extent to which the student might be responding in a purely random fashion. It was the sum of the absolute deviations of each of the VII scores from the standard score corresponding to a raw score of 14. Each VII scale contains 28 forced choice items and a subject responding randomly (because of no well-defined interests) would theoretically choose half of the items to each scale, or 14. Measuring the deviation of the obtained standard score from the standard score equivalent of 14 for all scales thus constituted a Random Dif score. Just how different a raw score of 14 was for the eight scales can be seen from the standard score equivalents of "14" proceeding from Service to Arts & Entertainment: 46 58 54 51 44 47 56 45. Business Contact, second in line, was the least popular area, while Outdoor interest was most popular, having the lowest standard score equivalent.

Other measures based on Roe's system of vocational classification were: (a) a coding of present major by Roe Group (those without a major coded 0), and (b) a score indicating S's highest VII standard score. (There were only 173 cases in which there was a tie between highest scores and here S's "high" was a random choice between the two.)

Data Analyses. Intercorrelations among all variables became the basis for two stepwise multiple regression analyses predicting the no major status from all available variables, and then solely from the pre-college variables (excluding college credits and GPA spring 1974).

Results

Table 1 presents the correlations of predictor variables with college major, including no majors, where majors have been assigned to one of Roe's

Groups. (There were no programs appropriate to Roe's Group 2, Business Contact.) Upperclassmen without majors constituted 24.4% of the sample. For 1620 degrees of freedom an r of .06 is significant at the .01 level and r = .08 at the .001 level.

Not unexpectedly, the concurrent measures of college performance--GPA and credits earned--were most predictive of no major, i.e., no majors had lower grades and had accumulated fewer credits in spite of the fact that they had entered college at the same time as the students who had declared a major. Next most predictive were the HS GPA performance of no majors and their pre-college test scores--all uniformly lower than those of students with majors. Sex and age proved unrelated to no major status and for the VII scales, correlations with no major were low. There was a very slight indication that no majors were higher in Business Contact (.09) and lower in Outdoor interests (-.07). The three differentiation scores were all negatively related to no major in accord with prediction from Holland's theory, however, the magnitude of the correlations was, even when significant, disappointingly low.

Table 2 reports the results of first, a stepwise multiple regression analysis utilizing all predictors, and second, the same analysis omitting college GPA and college credits as predictors. In the first analysis the two college variables were highly predictive and were significantly augmented by Outdoor interest. Like Outdoor interest, planning to major in engineering was negatively related to no major. Business Contact interest was the fifth selected predictor and the last one to add significantly as reflected by the F test for the linear regression. The sixth variable selected was Median Dif, but it did not reach significance. In the second analysis HS mathematics grades and English Usage test scores were selected first and second, in place of the college variables, followed by Outdoor interest again and Median Dif. All of these predictors were negatively related to no major. Business orientation as a positive correlate of no major appeared again in that the fifth selected (nonsignificant) predictor was Planning to Major in Business. The amount of variance accounted for in the first analysis was 15%; in the second, 5%.

Table 1

Correlation of College Major Group with Predictors

(Decimal points omitted)

	College Major Coded by Roe Group							
Predictors	No Major	Ser	Org	Tec	Out	Sci	Cul	Art
	N=395	N=44	N=126	N=141	N=107	N=499	N=219	N=91
Cum HS GPA	-18	-01	04	04	-01	15	-01	-03
English GPA	-15	03	-01	-07	-05	14	07	02
Math GPA	-19	-02	04	13	01	14	-09	-06
Nat Sci GPA	-16	-05	03	08	06	12	-05	-04
Soc Sci GPA	-12	-01	04	01	-01	11	02	-06
Lang GPA	-14	01	02	-00	-02	14	00	-04
Elective GPA	-13	-00	04	04	-02	08	-03	04
Engl Compos	-14	03	-04	-02	-01	09	08	02
Vocabulary	-13	02	-05	00	02	08	06	01
Engl Usage	-15	02	-04	-00	01	08	08	03
Spelling	-07	04	01	-08	-08	06	09	03
Read Speed	-08	03	02	-02	03	03	04	-02
Read Compre	-12	00	-01	02	06	06	02	-01
Verb Compos	-14	03	-03	-03	-02	09	09	03
Quant Skills	-13	-05	07	20	08	07	-12	-10
Data Suff	-08	-03	03	15	06	04	-09	-07
Quant Judg	-14	-06	07	19	07	08	-10	-10
Applied Math	-09	-06	-06	16	06	04	-09	-08
Math Achieve	-15	-04	10	20	08	07	-11	-13
Quant Compos	-13	-05	08	20	08	07	-12	-11
Space Abil	-09	-05	-02	17	04	04	-09	02
Mech Reas	-06	-06	02	30	15	-06	-13	-07
Sex (female)	-01	08	-13	-23	-12	08	13	17
Age	03	-03	03	02	-04	00	-01	-03
Plnd maj Hum	-03	00	-03	-06	-06	-08	11	23

Note. Roe's Business Contact Group 2 not represented by any University major in this sample of 1,622 upperclassmen.

Table 1 (continued)

Correlation of College Major Group with Predictors

(Decimal points omitted)

	College Major Coded by Roe Group							
Predictors	No Major	Ser	Org	Tec	Out	Sci	Cul	Art
Plnd maj Soc Sci	00	07	-00	-14	-09	-03	20	-01
Plnd maj Bio Sci	04	-01	-05	-10	10	11	-08	-09
Plnd maj Phy Sci	-04	-02	-05	-03	13	13	-08	-08
Plnd maj Engin	-06	-06	01	48	-02	-11	-11	-06
Plnd maj Bus	06	-01	24	-05	-07	-07	-05	-02
Plnd maj Voc Tec	05	-02	-03	06	-03	-01	-04	00
Plnd maj Other	02	00	-03	-07	-04	00	02	09
VII High Ser	03	09	-04	-08	-08	02	08	-04
VII High Bus	05	01	07	-03	-04	-05	02	-04
VII High Org	01	01	20	-01	-05	-05	-04	-02
VII High Tec	-03	-03	-04	29	03	-07	-07	-02
VII High Out	-02	-03	-03	-08	13	03	01	-02
VII High Sci	-02	-05	-07	-02	05	18	-11	-07
VII High Cul	-00	03	-03	-00	-03	-03	13	-07
VII High Art	-01	-02	-05	-05	-02	-07	02	28
VII Ser	04	12	-06	-17	-15	08	09	00
VII Bus	09	04	14	-02	-07	-12	03	-05
VII Org	04	00	18	06	-11	-05	-03	-09
VII Tec	-03	-06	05	27	05	-05	-14	-04
VII Out	-07	-03	-11	-08	19	05	03	03
VII Sci	-05	-05	-11	04	13	20	-16	-10
VII Cul	-01	06	01	-08	-06	-03	14	-03
VII Art	01	-05	-07	-04	-03	-09	06	27
Max-Min Dif	-05	01	04	00	03	02	-02	01
Median Dif	-06	02	01	02	03	02	-01	00
Random Dif	-07	-01	-14	-03	10	10	-03	09
College Cred	-32	04	11	06	-01	16	07	-05
College GPA	-29	01	05	04	-03	18	09	-02

Table 2

Order of Selection of Predictors of No Major from Stepwise Multiple Regression Analyses for 1622 UW Upperclassmen

	Predictor	R^2	Beta	F	R
All Predictors	College credits	.10	-.24	188.25****	-.32
	College GPA	.14	-.19	59.70****	-.29
	Outdoor interest	.14	-.33	9.79**	-.07
	Plnd maj Engin	.14	-.04	7.07**	-.06
	Business interest	.15	-.12	4.41*	.09
	Median Dif	.15	-.14	3.30	-.06
Pre-College Predictors Only					
	HS Math GPA	.04	-.13	60.82****	-.19
	English Usage	.04	-.24	12.95****	-.15
	Outdoor interest	.05	-.09	8.00**	-.07
	Median Dif	.05	-.15	4.84*	-.06
	Plnd maj Bus	.05	.03	3.64	.04

*p<.05

**p<.01

****p<.0001

Table 3 presents the correlations of the three differentiation measures with all other variables. Note that Median Dif and Max-Min Dif were highly related (.83)

Discussion

In interpreting the above percentages of variance accounted for, it is important to note that because of the dichotomous and unbalanced nature of the criterion (395 no majors vs. 1227 majors) there is an upper bound to the amount of criterion variability which can be accounted for. Following the procedure suggested by Carroll (1961) it is estimated that a continuous and normally distributed predictor (as might be assumed by any linear combination of the predictors in this study) could never account for more than 52% of the variance. In this light, and following the tradition of researchers in collegiate indecision, more will be made of the results than $\underline{R}^2 = .15$ would ordinarily indicate.

It is clear that academic ability concurrent and past is the most important predictor of indecisiveness in upperclass students. College credits earned was the strongest correlate of no major (-.32). The average number of credit hours was 129 with SD 17. Senior year status is defined as 135 hours so that 36% of the total group had officially achieved it. College GPA had the second highest $\underline{r}$ (-.29) with no major (mean 3.02, SD .46). In combination with these two concurrent academic measures none of the HS ability indices had anything to add. Non-academic measures were useful, however, in significantly increasing $\underline{R}^2$. No major was negatively related to Outdoor interest as well as Planned Major in Engineering, while positively related to having high interest in Business Contact, in which it should be noted, the University offered no program agreeing closely with Roe's definition.

When pre-college predictors alone were used in the regression analysis, quantitative ability as measured by HS mathematics GPA was the first selected predictor followed by verbal ability as measured by the English Usage test. Thereafter the non-academic predictors of Outdoor interest and Median Differentiation contributed slightly but significantly to $\underline{R}^2$.

Stahmann (1966) found that predicting graduation major field from pre-college data was best accomplished by simply asking students to state

Table 3

Correlations of Three Interest Differentiation Measures with All Other Variables (Decimal points omitted)

Variable	Mdn Dif	Ran Dif	M-M Dif	Variable	Mdn Dif	Ran Dif	M-M Dif
Sex (f)	-03	18	-05	Space Abil	04	08	05
Age	-01	-04	-04	Mech Reas	04	-02	04
HS GPA	09	11	09	VII Ser	-09	12	-06
English GPA	09	11	08	VII Bus	13	-36	10
Math GPA	08	07	10	VII Org	18	-31	15
Nat Sci GPA	09	10	09	VII Tec	-06	-07	-04
Soc Sci GPA	09	05	08	VII Out	-21	27	-23
Lang GPA	10	10	10	VII Sci	-00	30	02
Elective GPA	05	11	04	VII Cul	21	-13	21
Engl Compos	14	16	12	VII Art	-11	12	-10
Vocabulary	14	13	12	College Cred	09	06	07
Engl Usage	12	15	10	College GPA	10	06	10
Spelling	09	11	09	No Major	-06	-07	-05
Read Speed	03	02	02	Major Ser	02	-01	01
Read Compre	09	10	09	Major Org	01	-14	04
Verb Compos	13	15	11	Major Tec	02	-03	00
Quant Skills	11	04	12	Major Out	03	10	03
Data Suff	11	07	12	Major Sci	02	10	02
Quant Judg	10	02	11	Major Cul	-01	-03	-02
Applied Math	09	03	11	Major Art	00	09	01
Math Achieve	11	05	11	Planned Major Hum	01	04	00
Quant Compos	11	04	12	Planned Major Soc Sci	-00	-05	-02

Table 3 (continued)

Correlations of Three Interest Differentiation Measures

with All Other Variables

Variable	Mdn Dif	Ran Dif	M-M Dif
Planned Major Bio Sci	-04	14	-02
Planned Major Phy Sci	03	07	04
Planned Major Engineer	-01	-05	-02
Planned Major Business	05	-13	07
Planned Major Other Pro	-01	-06	-01
Planned Major Voc-Tec	03	01	04
VII High Ser	-03	07	-05
VII High Bus	02	-24	02
VII High Org	06	-17	04
VII High Tec	-01	-02	-04
VII High Out	-08	13	-09
VII High Sci	01	20	05
VII High Cul	08	-07	08
VII High Art	-07	07	-04
Mdn Dif		65	83
Ran Dif			57

their plans and intended major. Second in accuracy to "self-expressions" were interest scores, least predictive were achievement scores. But where one is predicting no major among upperclassmen, these three types of entrance data reverse themselves in efficiency. In the present study aptitude and achievement measures were better than interest measures which were better than "planned major" coded by students. Consistent with Stahmann's findings, however, were correlations of "planned major" with specific fields--.48 between Engineering plans and a Technical major; .24 between Business plans and an Organization major; .23 between Humanities plans and an Arts & Entertainment major.

These results thus extend the findings of Rose and Elton (1971) who found ability associated with freshman undecideds who finally graduated--they were more able than the vast majority of such undecideds who typically did not persist to graduation. Now, however, it appears that where major field indecision persists among the "stayers," it, too, is primarily related to ability. Further, lack of differentiation of interests in high school hints at contributing minimally to late indecisiveness and deserves continued exploration as a viable construct in vocational decision-making.

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